

Importance of Assessing Nutritional Health in Patients with MS

Mona Bostick RDN, LDN



THE CONSORTIUM OF
MULTIPLE SCLEROSIS CENTERS

2020 CMSC VIRTUAL ANNUAL MEETING

Accreditation and Credit Designation

In support of improving patient care, the Consortium of Multiple Sclerosis Centers (CMSC) is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

PHYSICIANS

The CMSC designates this enduring material for 1.0 *AMA PRA Category 1 Credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

NURSES

The CMSC designates this enduring material for 1.0 contact hour of continuing nursing education.



Accreditation and Credit Designation (Cont'd)

PHARMACISTS

This knowledge based activity (UAN JA4008165-0000-20-016-H01-P) qualifies for 1.0 contact hour (0.1 CEUs) of continuing pharmacy education credit.

PAs

The CMSC has been authorized by the American Academy of PAs (AAPA) to award AAPA Category 1 CME credit for activities planned in accordance with AAPA CME Criteria. This activity is designated for 1.0 AAPA Category 1 CME credit. PAs should only claim credit commensurate with the extent of their participation.



Accreditation and Credit Designation (Cont'd)

PSYCHOLOGISTS

Continuing Education (CE) credits for psychologists are provided through the co-sponsorship of the American Psychological Association (APA) Office of Continuing Education in Psychology (CEP) and the Consortium of Multiple Sclerosis Centers (CMSC). The CMSC maintains responsibility for the content of the program. This activity is awarded 1.0 CE credits.

SOCIAL WORKERS

As a Jointly Accredited Organization, the CMSC is approved to offer social work continuing education by the Association of Social Work Boards (ASWB) Approved Continuing Education (ACE) program. Organizations, not individual courses, are approved under this program. State and provincial regulatory boards have the final authority to determine whether an individual course may be accepted for continuing education credit. CMSC maintains responsibility for this course. Social workers completing this course receive 1.0 continuing education credit.



Disclosure of Financial Relationships

- The author of this presentation has no financial interest or affiliation with any organizations that could be perceived as a potential conflict of interest concerning the subject of this presentation

Learning Objective(s)

- Define the role of Health Literacy and Food Literacy in health outcomes
- Review tools to facilitate nutrition conversations with patients
- Review nutrition risk indicators beyond BMI
- Review unintended consequences of popular “diets”
- Outline role of Registered Dietitian Nutritionist RDN on MS healthcare team

**DOES EATING WELL MEAN
SOMETHING DIFFERENT WHEN
LIVING WITH MS?**

DEPENDS ON WHO YOU ASK...

CONVENTIONAL OR UNCONVENTIONAL

No Diet has been proven to alter the course of Multiple Sclerosis disease process

INTEGRATIVE



COMPLEMENTARY



ALTERNATIVE
NATUROPATHY
FUNCTIONAL MEDICINE
HOLISTIC

Who did your patient ask?

National Institutes of Health (NIH) National Center for Complementary and Integrative Health
<https://www.nccih.nih.gov/health/complementary-alternative-or-integrative-health-whats-in-a-name>

Nutrition Care Process (NCP) is a systematic approach to providing high quality nutrition care. The NCP consists of four distinct, interrelated steps:

Nutrition Assessment: The RDN collects and documents information such as food or nutrition-related history; biochemical data, medical tests and procedures; anthropometric measurements, nutrition-focused physical findings and client history.

Nutrition Diagnosis: Data collected during the nutrition assessment guides the RDN in selection of the appropriate nutrition diagnosis (i.e., naming the specific **problem**).

Nutrition Intervention: The RDN then selects the nutrition **intervention** that will be directed to the root cause (or etiology) of the nutrition problem and aimed at alleviating the signs and symptoms of the diagnosis.

Nutrition Monitoring/Evaluation: The final step of the process is **monitoring and evaluation**, which the RDN uses to determine if the client has achieved, or is making progress toward, the planned goals (**outcome**).

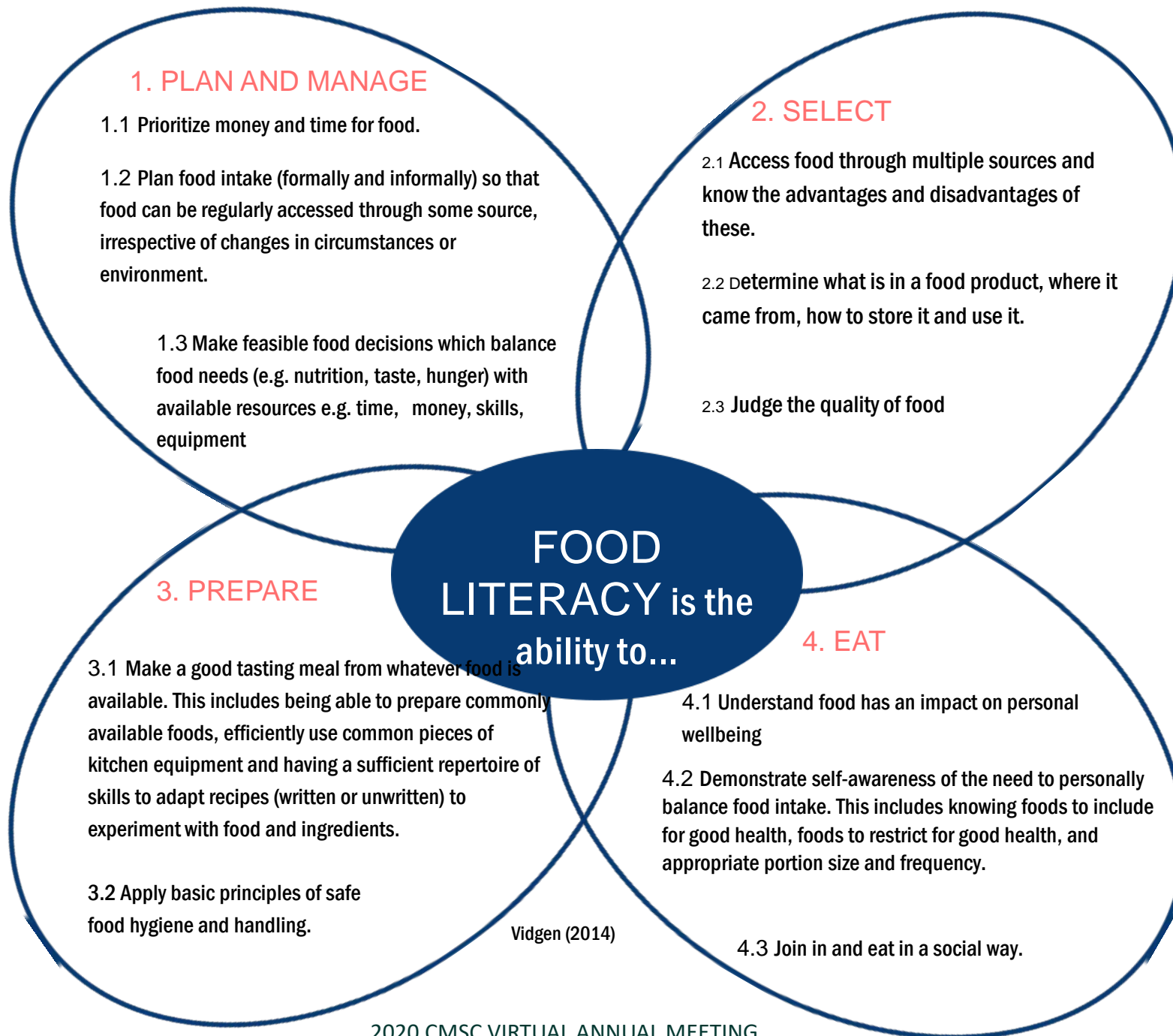
HEALTH LITERACY, FOOD LITERACY AND HEALTH OUTCOMES

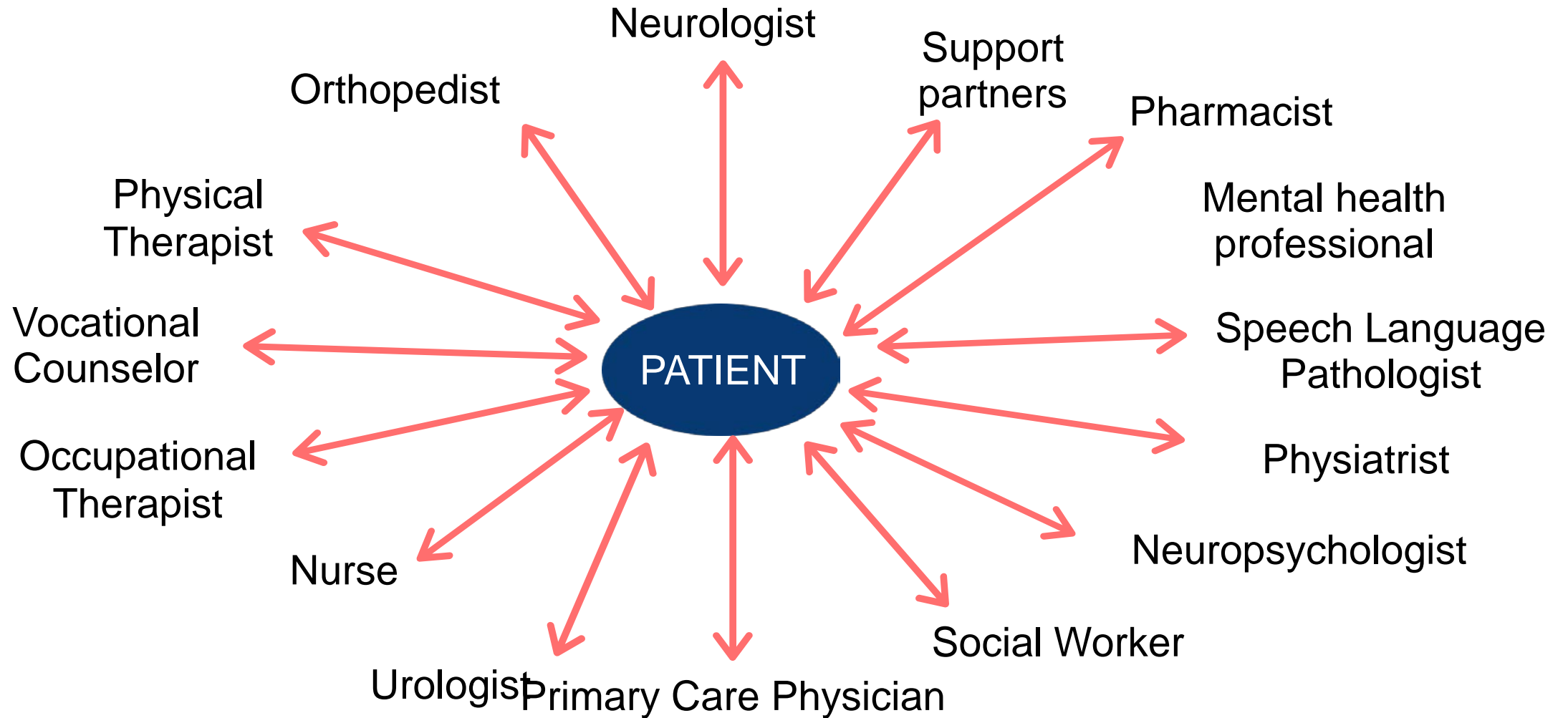
Health Literacy: the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.

Food Literacy: the juncture where community food security and individual food skills intertwine. For an individual or population to be food literate and to fully engage in their food system, an ecological approach is necessary, in that individual behaviors and skills cannot be separated from their environmental or social context. It is theorized that increasing food literacy will lead to increased health and well-being.

Health Outcomes: Health literacy and Food literacy work in conjunction to enable individuals to take ownership over their health and well-being.







Katz 2018

DETERMINE CHECKLIST

	YES
I have an illness or condition that made me change the kind and/or amount of food I eat.	2
I eat fewer than 2 meals per day.	3
I eat few fruits or vegetables or milk products.	2
I have 3 or more drinks of beer, liquor or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
I take 3 or more different prescribed or over-the-counter drugs a day.	1
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2
I am not always physically able to shop, cook and/or feed myself.	2

<https://nutritionandaging.org/wp-content/uploads/2017/01/DetermineNutritionChecklist.pdf>

TOTAL

CASE STUDY #1: NEWLY DIAGNOSED

- Fearful and **anxious** about new MS diagnosis
- **Overwhelmed** by conflicting and confusing nutrition information that family, friends, co-workers are recommending
- What should I be eating or not eating **because of MS**?
- What **supplements** should people with MS be taking?
- Is there a **Therapeutic** Diet for MS?

What is a THERAPEUTIC DIET?

A clinical nutrition intervention/ meal plan that controls the intake of certain foods or nutrients. It is part of the treatment of a medical condition and are normally prescribed by a physician and planned by a dietitian.

Therapeutic diets are modified for:

- Nutrients (sodium, fiber, electrolytes consistent carb, etc)
- Texture (food and or beverage) 2/2 dysphagia
- Food allergies/intolerances (celiac, lactose intolerant)
- Alternate route feeding enteral (in place of or in addition to oral meals)parenteral feeding



THERAPEUTIC DIETS INDICATED FOR MS?



- What outcome are you hoping for?
- What nutrients or foods are you controlling the intake of? Why?
- When you recommend, suggest, prescribe a nutrition intervention, what does your patient understand will be the outcome? Expectation?
- Are you following up with patient to ensure that intervention(s) have been implemented? To ensure comprehension?

CASE STUDY #1: NEWLY DIAGNOSED

- Fearful and **anxious** about new MS diagnosis
- **Overwhelmed** by conflicting and confusing nutrition information that family, friends, co-workers are recommending
- What should I be eating or not eating **because of MS**?
- What **supplements** should people with MS be taking?
- Is there a **Therapeutic** Diet for MS?



Food and nutrition knowledge/skill deficit related to new Multiple Sclerosis diagnosis and lack of prior exposure to nutrition related information as evidenced by reports of overwhelm and confusion about diet.

CASE STUDY #2: OBESE WITH COMORBID CONDITIONS

- **BMI 31.4**
- Type 2 Diabetes, Hypertension, elevated blood fats, peri menopause
- Reports having tried **LOTS** of diets but has been unsuccessful at sustained weight loss/maintenance over last **25** years.
- Describes herself as a **food addict**
- Uncomfortable at gym because of **MS** and **body image**.
- Has received a few diet handouts from various doctor over the years but nothing seems to have stuck

THE ROLE OF COMORBIDITIES IN MS HEALTH OUTCOMES

- Hypertension
- CVD
- Glucose Control
- Bone Health
- Disordered Eating

There is NO THERAPEUTIC "MS DIET"... however, each of these comorbidities has evidence-based nutrition interventions proven to improve health outcomes.

WEIGHT LOSS...

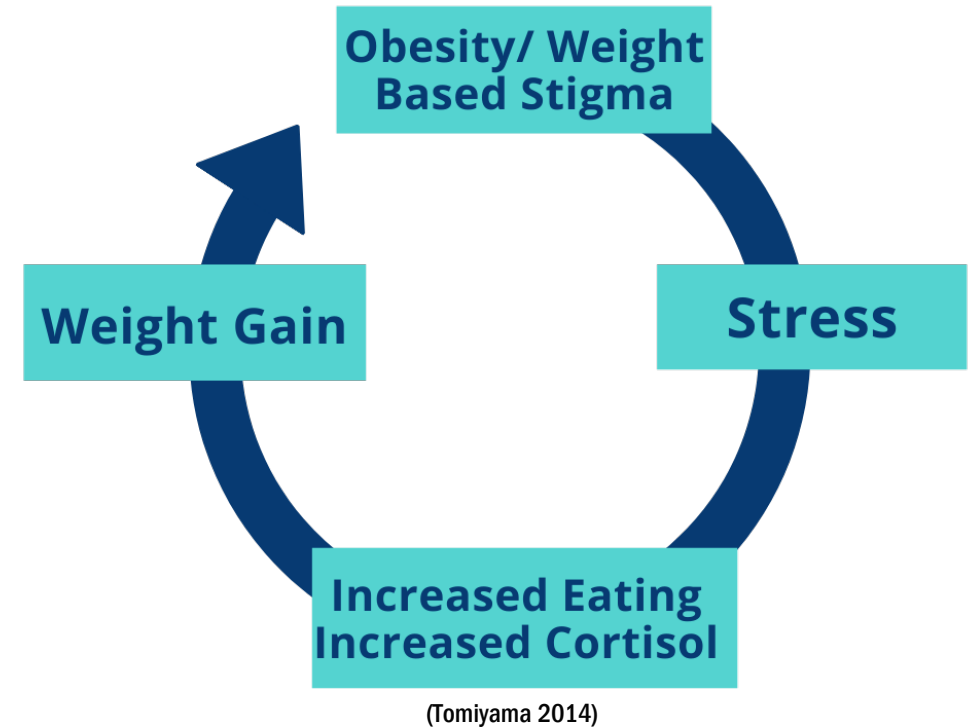


We have lost the war on obesity. **Fighting fat hasn't made fat go away.** Extensive "collateral damage" has resulted. Food and body preoccupation, self-hatred, eating disorders, discrimination, poor health. Few of us are at peace with our bodies, whether because we're fat or because we fear becoming fat.

Linda Bacon PhD

WHAT IS WEIGHT STIGMA?

- **Weight bias** or weight-based discrimination
- “A broad range of experiences from minor, everyday instances of differential treatment, or ‘microaggressions’ (e.g., being treated with less respect than others in subtle ways), to being treated unjustly in specific contexts (e.g., being denied employment).” (Pearl 2018)
- “The social devaluation and denigration of people perceived to carry excess weight, [which] leads to prejudice, negative stereotyping and discrimination toward those people.” (Tomiyaama 2014)



WEIGHT STIGMA → HEALTH EFFECTS

Weight stigma in **medical settings** → avoidance of medical care (Phelan et al. 2015)

- Implicit and explicit weight bias from healthcare providers (including dietitians)
- Misdiagnosis and misattribution of symptoms based on weight
- Greater likelihood of being prescribed weight management instead of necessary interventions for actual health conditions
- Lower likelihood of patient following provider recommendations
- Delaying care → worse health outcomes and more advanced disease states
- Comorbidity delays diagnosis and increases disability at diagnosis (Marrie 2009)

Doctors = most frequent source of weight stigma reported by women & 2nd most frequent source reported by men (Puhl & Brownell 2006)

False positives & false negatives—smaller-bodied people deemed “healthy,” larger-bodied people deemed “sick” (Tylka et al. 2014)

There are several barriers thought to contribute to the under-recognition and undertreatment of obesity. Physicians negative attitudes towards patients with obesity and their view of themselves as not prepared to treat obesity are two such barriers. (Mastrocola 2019)



<https://bitemywords.com/2018/07/23/a-smile-doesnt-hide-your-weight-bias/>

WEIGHT STIGMA → HEALTH EFFECTS

Independent health risk factor (Vadiveloo & Mattei 2017):

- Higher levels of weight stigma = more than 2x risk of high allostatic load
- Allostatic load = cumulative effect of chronic stressors on cardiovascular, nervous, and metabolic systems
- Controlled for BMI, so excess risk not explained by body size
- Metabolic and lipid dysregulation
- Impaired glucose metabolism
- ↑ Inflammation
- ↑ risk for type 2 diabetes, hypertension, cardiovascular disease, and mortality
- WS is greater risk factor than diet
- Equivalent to risk of physical inactivity

Raises cortisol (stress hormone) in experimental settings (Himmelstein et al. 2015) and assoc. w/increased inflammatory markers (Wu & Berry 2018)

WEIGHT STIGMA → HEALTH EFFECTS

- **Greater body dissatisfaction (Wu & Berry 2018)**
- **Increased risk of disordered eating (Ibid.)**
- **Increased risk of depression, anxiety, and low self-esteem (Ibid.)**
- **Lower rates of physical activity (Jackson & Steptoe 2017)**
- **Even people in “normal” BMI range w/high internalized WS experience more frequent illness (Muennig et al. 2008)**

WHAT IS **WEIGHT CYCLING**?

Weight cycling = repeated weight loss and regain

Weight loss interventions (diets, “lifestyle changes,” etc.) are ineffective in the long run (Mann et al. 2007)

- Large body of evidence showing that it’s very rare for people to “lose weight and keep it off”
- Review of randomized studies w/ at least 2 years of follow-up
- Average amount of weight loss maintained is only 2.4 lbs., **still “obese” BMI**
- 1/3 to 2/3 of people regain more weight than they lost
- “It is only the rate of weight regain, not the fact of weight regain, that appears open to debate.”

WT MANAGEMENT → **WT CYCLING & DISORDERED EATING**

Weight-management paradigm:

- With enough effort, people can lose weight and keep it off permanently
- Intentional weight loss (IWL) sets people up for weight cycling
- IWL is not effective in long run (Mann et al. 2007)
- Therefore, efforts at weight management almost inevitably lead to cycles of loss and regain (Tylka et al. 2014)

Typical WL trajectory (Dansinger et al. 2007):

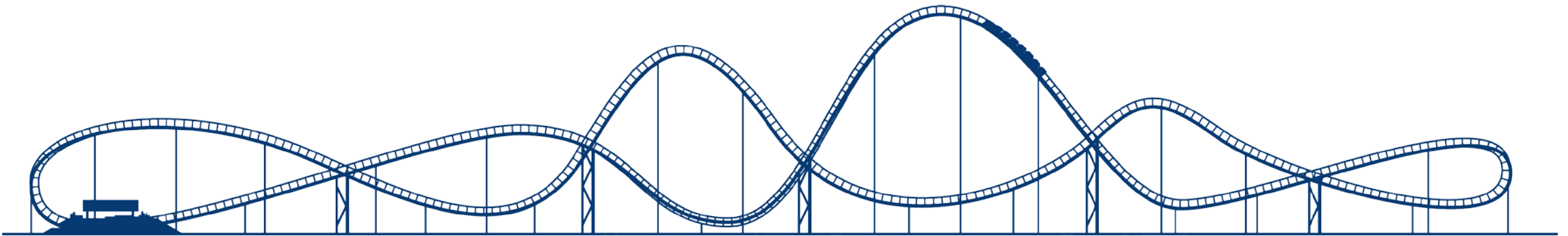
- Weight reaches lowest point ~6 months of IWL intervention
- Starts increasing at about 1 year
- Rate of weight regain speeds up over time

People trying to lose weight are more likely to weight cycle than not.

WT MANAGEMENT → WT CYCLING & DISORDERED EATING

Efforts not to weight cycle → disordered eating

- Trying to achieve and **maintain** a weight-suppressed state increases risk of binge eating disorder and bulimia nervosa (Tylka et al. 2014)
- Likely because maintaining a weight-suppressed state requires rigid dietary **control** and often leads to rebound binge eating (Ibid.)



Weight Cycling (WC): Health Effects

WC increases likelihood of binge eating (Field et al. 2004)

WC has wide range of physical health risks (Tylka et al. 2014)

- Higher mortality
- Higher risk of osteoporotic fractures and gallstone attacks
- Loss of muscle tissue
- Chronic inflammation
- Some forms of cancer such as renal cell carcinoma, endometrial cancer, and non-Hodgkin's lymphoma
- Hypertension
- Heart disease risk



IS THERE A **WEIGHT INCLUSIVE** APPROACH?

Health At Every Size® (HAES®)

- Developed by group of dietitians & other health professionals in 1990s
- Response to concern w/ growing weight stigma in society & medicine
- Designed to help combat disordered eating, chronic dieting, weight- based discrimination, & health disparities
- Interdisciplinary model that includes nutrition, mental health, sociological factors, physical health

Health At Every Size® (HAES®) Principles

Weight Inclusivity: Accept and respect the inherent diversity of body shapes and sizes and reject the idealizing or pathologizing of specific weights.

Health Enhancement: Support health policies that improve and equalize access to information and services, and personal practices that improve human well-being, including attention to individual physical, economic, social, spiritual, emotional, and other needs.

Respectful Care: Acknowledge our biases, and work to end weight discrimination, weight stigma, and weight bias. Provide information and services from an understanding that socio-economic status, race, gender, sexual orientation, age, and other identities impact weight stigma, and support environments that address these inequities.

Health At Every Size® (HAES®) Principles

Eating for Well-being: Promote flexible, individualized eating based on hunger, satiety, nutritional needs, and pleasure, rather than any externally regulated food rules focused on weight control. [Food Literacy, Intuitive Eating,]

Life-Enhancing Movement: Support physical activities that allow people of all sizes, abilities, and interests to engage in enjoyable movement, to the degree that they choose and are able.

HEALTH OUTCOMES OF **HAES APPROACH**

Better long-term outcomes (Bacon & Aphramor 2011):

- Lower blood pressure
- More favorable lipid profile
- Increased physical activity
- Lower levels of disordered eating
- Better mood
- Increased self-esteem
- Better body image
- Significantly higher retention rates than conventional weight management
- No weight cycling
- Greater **resilience** to weight stigma

HAES: MEASURES USED TO ASSESS HEALTH OUTCOMES

Everything **except** weight, BMI, or other body-size / body-composition measurements

- LDL and HDL
- Triglycerides
- Hemoglobin A1C
- Blood pressure
- Dietary recall
- Self-reported physical activity
- Disordered-eating measures
- Body image
- Self-esteem

**THE HEALTH BENEFITS OF EATING WELL
AND PHYSICAL ACTIVITY ARE
INDEPENDENT OF WEIGHT LOSS.**

CASE STUDY #2: OBESE WITH COMORBID CONDITIONS

- **BMI 31.4**

- Type 2 Diabetes, Hypertension, elevated blood fats, peri menopause
- Reports having tried **LOTS** of diets but has been unsuccessful at sustained weight loss/maintenance over last 25 years.
- Describes herself as a **food addict**
- Uncomfortable at gym because of **MS** and **body image concerns**.
- Has received a few diet handouts from various doctor over the years but nothing seems to have stuck

➤ Obesity related to lifelong pattern of chronic dieting as evidenced by history of weight cycling >5kg x 5 years.

➤ Altered nutrition related lab values related to food and nutrition related knowledge deficit as evidenced by [HgA1c= 8.4%], [LDL=190], [TG=194], [BP=130/90]



“DIETS” have been used for ages to **"control"** weight. When one receives a life altering health diagnosis like MS, many turn to "diets" with the desire to **"control"** the disease process...

WHAT IS ORTHOREXIA?

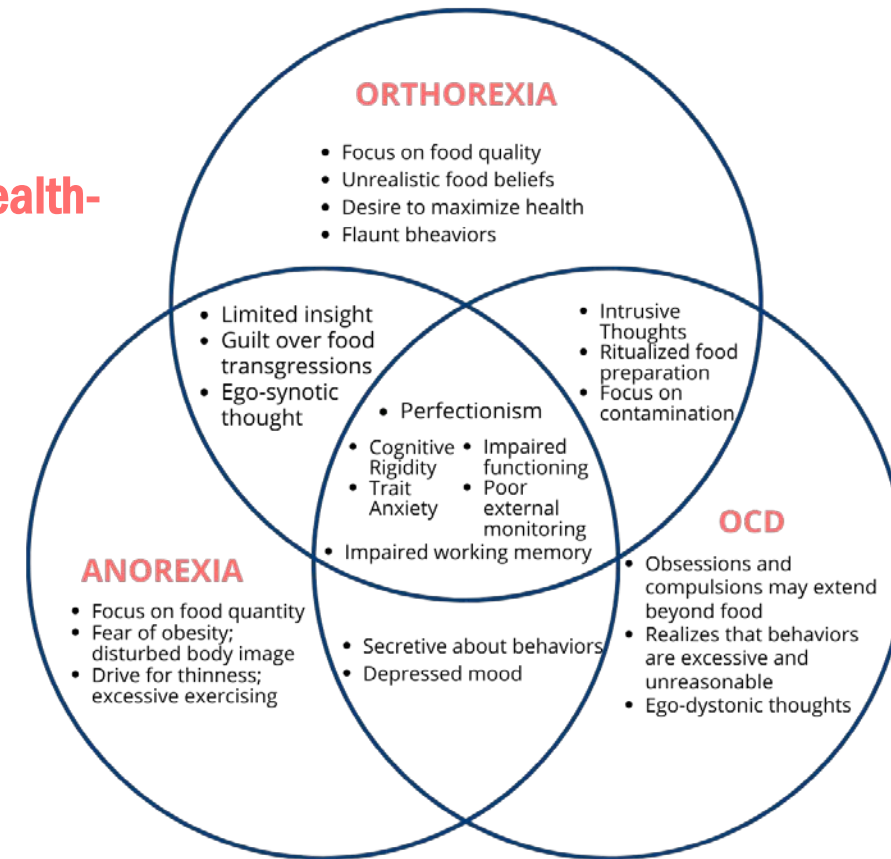
Orthorexia nervosa describes a pathological obsession with proper nutrition that is characterized by a restrictive diet, ritualized patterns of eating, and rigid avoidance of foods believed to be unhealthy or impure (Koven 2015)

Adopt eating habits given a desire to be healthy, natural, or pure, entertaining unrealistic, if not magical, beliefs about certain foods. **Often exacerbated by health-related anxiety.** (Koven 2015)

Perfectionism, rigid thinking, excessive devotion, hyper-morality, and a preoccupation with details and perceived rules (Ibid)

More likely to **flaunt their habits.** (Ibid)

In a recent survey of psychologists, psychiatrists, nurses, and social workers, two-thirds reported having observed patients in their practice presenting with **clinically significant orthorexia** (Ibid)



CASE STUDY #3: MANAGE MS "NATURALLY"

- Does not **trust** "Big Pharma"
- Prefers to manage MS **"naturally"**
- Wants to know what supplements will help **"heal the gut"**
- Wants guidance on food sensitivities.
- Believes strongly that **Food Is Medicine**
- Wants guidance on protocols and diets

“DIETS” ARE NOT RISK-FREE INTERVENTIONS

NOUN OR VERB?

- Are there consequences of overly simplistic nutrition recommendations?
- What are your patient's expectations?
- Have you considered unintended consequences?

ANTI-
INFLAMMATORY
DIET

RESTRICTIVE

GLUTEN
FREE DIET

INTERMITTENT
FASTING

AUTOIMMUNE
PROTOCOL

PALEO

CASE STUDY #3: MANAGE MS "NATURALLY"

- Does not **trust** "Big Pharma"
- Prefers to manage MS **"naturally"**
- Wants to know what supplements will help **"heal the gut"**
- Wants guidance on food sensitivities.
- Believes strongly that **Food Is Medicine**
- Wants guidance on protocols and diets

- Poor nutrition quality of life related to unsupported beliefs/attitudes about food, nutrition, and nutrition related topics as evidenced by fear of foods or dysfunctional thoughts regarding food or food experiences.
- Disordered eating pattern related to disbelief in science-based food and nutrition information as evidenced by avoidance of foods/ food groups and intake of CAM products/dietary supplements that may be unsupported for health

Role of the Registered Dietitian Nutritionist **RDN**

Conduct a thorough **clinical nutrition assessment** to elucidate nutrition status of patient and Identify malnourished patients and those at nutritional risk

If present, ensure mild, moderate or severe **malnutrition** is included as a complicating condition in **coding process**

Implement **comprehensive nutrition intervention** and continued monitoring of nutrition status

Provide personally **tailored** nutrition education and guidance

Educate and help patient engage in **health promoting behaviors** related to improvement of chronic comorbid conditions

Help patient navigate barriers to health, referring to OT, PT, SLP, PsyD or other healthcare provider as appropriate/ warranted.

Actively contribute nutrition expertise and **engage other team members** with assessment data on progress made with nutrition care efforts

CLINICAL IMPACT/BENEFITS

Patient Safety

- Clinical RDNs are conventionally educated and able to provide evidence-based nutrition recommendations.
- RDNs familiar with the unique challenges faced by MS patients can educate around the safe use of complementary modalities

Patient Satisfaction (Bishop 2020)

- Patients have LOTS of questions about nutrition
- They also want/need guidance and support during behavior change

Improved Health Outcomes

- RDNs are trained to assess nutrition status and recommend nutrition interventions to improve health outcomes.

PRACTICE APPLICATIONS

- **Consider the Health / Food Literacy of your patients when making nutrition recommendations.**
- **Implement the DETERMINE checklist to initiate a conversation about nutrition status with your patients that does not focus exclusively on BMI.**
- **Research HAES, intuitive eating, weight stigma, and weight cycling for yourself.**
- **BMI is one of many health indicators, consider nutrition interventions to address others.**
- **RDNs not already familiar with clinical nutrition needs of patients with MS will require education**
- **Include Registered Dietitian Nutritionist in Interdisciplinary MS Healthcare Team**

REFERENCES

Academy of Nutrition and Dietetics, Commission on Dietetic Registration. *Code of Ethics for the Nutrition and Dietetics Profession.*; 2018.

Tomiyama AJ. Weight Stigma Is Stressful. A Review of Evidence for the Cyclic Obesity/Weight-Based Stigma Model. *Appetite*. 2014;82:8-15.

Pearl RL. Weight Bias and Stigma: Public Health Implications and Structural Solutions. *Soc Issues Policy Rev*. 2018.

Cullen T, Hatch J, Martin W, et al. (2015). Food literacy: Definition and framework for action. *Canadian Journal of Dietetic Practice and Research*, 76(3), 140-145.

Puhl RM, Brownell KD. Confronting and Coping with Weight Stigma: An Investigation of Overweight and Obese Adults*. *Obesity*. 2006;14(10):1802-1815.

Dewalt DA, Berkman ND, Sheridan S, et al. Literacy and health outcomes: a systematic review of the literature. *J Gen Intern Med* 2004 Dec;19(12):1228-39.

Tylka TL, Annunziato RA, Burgard D, et al. The weight-inclusive versus weight-normative approach to health: evaluating the evidence for prioritizing well-being over weight loss. *J Obes*. 2014;2014:983495.

Vadiveloo M, Mattei J. Perceived Weight Discrimination and 10-Year Risk of Allostatic Load Among US Adults. *Ann Behav Med*. 2017;51(1):94-104.

Himmelstein MS, Incollingo Belsky AC, Tomiyama AJ. The Weight of Stigma: Cortisol Reactivity to Manipulated Weight Stigma. *Obesity*. 2015;23(2):368-374.

ASDAH: HAES® Principles. <https://www.sizediversityandhealth.org/content.asp?id=152>. Accessed April 15, 2020

Chiovetti, Ann Bridging The Gap Between Health Literacy And Patient Education For People With Multiple Sclerosis *Journal of Neuroscience Nursing*, October 2006, volume 38, Number 5, 374-378

Bauer JM, Kaiser MJ, Sieber CC. Evaluation of nutritional status in older persons: nutritional screening and assessment. [Curr Opin Clin Nutr Metab Care](#). 2010 Jan;13(1):8-13.

REFERENCES

- Wu Y-K, Berry DC. Impact of weight stigma on physiological and psychological health outcomes for overweight and obese adults: A systematic review. *J Adv Nurs*. 2018;74(5):1030-1042.
- Phelan SM, Burgess DJ, Yeazel MW, Hellerstedt WL, Griffin JM, van Ryn M. Impact of Weight Bias and Stigma on Quality of Care and Outcomes for Patients with Obesity. *Obes Rev*. 2015;16(4):319-326.
- Jackson SE, Steptoe A. Association between perceived weight discrimination and physical activity: a population-based study among English middle-aged and older adults. *BMJ Open*. 2017;7(3):e014592.
- Muennig P, Jia H, Lee R, Lubetkin E. I Think Therefore I Am: Perceived Ideal Weight as a Determinant of Health. *Am J Public Health*. 2008;98(3):501-506.
- Mann T, Tomiyama AJ, Westling E, Lew A-M, Samuels B, Chatman J. Medicare's search for effective obesity treatments: Diets are not the answer. *Am Psychol*. 2007;62(3):220-233.
- Dansinger ML, Tatsioni A, Wong JB, Chung M, Balk EM. Meta-analysis: the effect of dietary counseling for weight loss. *Ann Intern Med*. 2007;147(1):41-50.
- Field AE, Manson JE, Taylor CB, Willett WC, Colditz GA. Association of weight change, weight control practices and weight cycling among women in the Nurses' Health Study II. *Int J Obes*. 2004;28(9):1134-1142.
- Bacon L, Aphramor L. Weight Science: Evaluating the Evidence for a Paradigm Shift. *Nutr J*. 2011;10(1):9.
- Frederick DA, Saguy AC, Sandhu G, Mann T. Effects of competing news media frames of weight on antifat stigma, beliefs about weight and support for obesity-related public policies. *Int J Obes*. 2016;40(3):543-549.
- Katz, David L, How to Improve Clinical Practice and Medical Education About Nutrition AMA Journal of Ethics October 2018, Volume 20, Number 10: E994-1000

REFERENCES

Plow M, Finlayson M, Cho C. Correlates of nutritional behavior in individuals with multiple sclerosis. *Disabil Health J*. 2012 Oct;5(4):284-91. doi: 10.1016/j.dhjo.2012.05.007. Epub 2012 Aug 17.

Carrara A, Schulz PJ. The role of health literacy in predicting adherence to nutritional recommendations: A systematic review. *Patient Educ Couns*. 2018 Jan;101(1):16-24.

Vidgen HA, Gallegos D. Defining food literacy and its components. *Appetite*. 2014 May;76:50-9. doi: 10.1016/j.appet.2014.01.010. Epub 2014 Jan 22.

Velardo S. The Nuances of Health Literacy, Nutrition Literacy, and Food Literacy. *J Nutr Educ Behav*. 2015 Jul-Aug;47(4):385-9.e1. doi: 10.1016/j.jneb.2015.04.328. Epub 2015 May 27.

Academy of Nutrition and Dietetics (AND), International Dietetics and Nutrition Terminology (IDNT) Reference Manual Standardized Language For The Nutrition Care Process 4th edition. 2013

Sahyoun NR, Jacques PF, Dallal GE, Russell RM. Nutrition Screening Initiative Checklist may be a better awareness/educational tool than a screening one. *J Am Diet Assoc*. 1997 Jul;97(7):760-4.

Nutrition Screening Initiative Checklist: <https://nutritionandaging.org/wp-content/uploads/2017/01/DetermineNutritionChecklist.pdf>

Toolkit: The Nutrition Screening Initiative's DETERMINE CHECKLIST and Senior Malnutrition <https://nutritionandaging.org/toolkit-the-nutrition-screening-initiatives/>

Nutrition Screening Initiative Level 2 https://content.highmarkprc.com/Files/EducationManuals/GeriatricResourceBinder/level2_nutrition.pdf

Fildes A, Charlton J, Rudisill C, Littlejohns P, Prevost AT, Gulliford MC. Probability of an Obese Person Attaining Normal Body Weight: Cohort Study Using Electronic Health Records. *Am J Public Health*. 2015;105(9):e54-e59. doi:10.2105/AJPH.2015.302773

Berrigan LI, Fisk JD, Patten SB, et al. Health-related quality of life in multiple sclerosis: Direct and indirect effects of comorbidity. *Neurology*. 2016;86(15):1417-1424.

REFERENCES

- Lavorgna L, De Stefano M, Sparaco M, et al Fake News, influencers and health-related professional participation on the Web: A pilot study on social network of people with Multiple Sclerosis. *Multiple sclerosis and Related Disorders* 25(2018) 175-178.
- Namjooyan F, Ghanavati R, Majdinasab N, Jokari S, Janbozorgi M. Uses of complementary and alternative medicine in multiple sclerosis. *J Tradit Complement Med.* 2014;4(3):145-152.
- Katz Sand I. The Role of Diet in Multiple Sclerosis: Mechanistic Connections and Current Evidence. *Curr Nutr Rep.* 2018;7(3):150-160. doi:10.1007/s13668-018-0236-z
- Moss BP, Rensel MR, Hersh CM. Wellness and the Role of Comorbidities in Multiple Sclerosis. *Neurotherapeutics.* 2017;14(4):999-1017.
- Marrie RA, Cohen J, Stuve O, et al. A systematic review of the incidence and prevalence of comorbidity in multiple sclerosis: overview. *Mult Scler.* 2015;21(3):263-281.
- Conway DS, Thompson NR, Cohen JA. Influence of hypertension, diabetes, hyperlipidemia, and obstructive lung disease on multiple sclerosis disease course. *Multiple sclerosis (houndmills, basingstoke, england).* 2017;23(2):277-285.
- Overs S, Hughes CM, Haselkorn JK, Turner AP. Modifiable comorbidities and disability in multiple sclerosis. *Current neurology and neuroscience reports.* 2012;12(5):610-617.
- Corallo F, Cannistraci C, Rifici C, Sessa E, Bramanti P, Marino S. Body image in multiple sclerosis patients: a descriptive review. *Neurological sciences.* 2019;40(5):923-928.
- Roque SS, Benning LV. Obesity education in medical schools, residencies, and fellowships throughout the world: a systematic review. *International journal of obesity.* 2020;44(2):269-279.
- Matusik E, Augustak A, Durmala J. Functional mobility and basic motor skills in patients with multiple sclerosis and its relation to the anthropometrical status and body composition parameters. *Medicina (kaunas, lithuania).* 2019;55(12).

REFERENCES

- Mensinger JL, Calogero RM, Stranges S, Tylka TL. A weight-neutral versus weight-loss approach for health promotion in women with high bmi: a randomized-controlled trial. *Appetite*. 2016;105:364-374.
- Bishop M, McDaniels B, Byung-Jin K. A population-based investigation of health-care needs and preferences in American adults with multiple sclerosis. *Journal of patient experience*. 2020;7(1):34-41.
- Koven NS, Abry AW. The clinical basis of orthorexia nervosa: emerging perspectives. *Neuropsychiatric disease and treatment*. 2015;11:385-394. doi:10.2147/NDT.S61665
- Kornstein SG, Kunovac JL, Herman BK, Culpepper L. Recognizing Binge-Eating Disorder in the Clinical Setting: A Review of the Literature. *Prim Care Companion CNS Disord*. 2016;18(3):10.4088/PCC.15r01905. Published 2016 May 26.
- Quick VM, Byrd-Bredbenner C, Neumark-Sztainer D. Chronic illness and disordered eating: a discussion of the literature. *Adv Nutr*. 2013;4(3):277-286. Published 2013 May 1.
- GBD 2017 Diet Collaborators. Health effects of dietary risks in 195 countries, 1990-2017: a systematic analysis for the global burden of disease study 2017. *Lancet (london, england)*. 2019;393(10184):1958-1972.
- Glovsky E Wellness Not Weight: Health at Every Size and Motivational Interviewing, First Edition, 2014 Cognella Academic Publishing
- Long C, Blundell J, Finlayson G. A systematic review of the application and correlates of YFAS-diagnosed 'food addiction' in humans: are eating-related 'addictions' a cause for concern or empty concepts? *Obesity facts*. 2016;8(6):386-401.
- Pearl RL, Puhl RM. The distinct effects of internalizing weight bias: an experimental study. *Body image*. 2016;17:38-42.
- National Network of Libraries of Medicine: Health Literacy <https://nnlm.gov/initiatives/topics/health-literacy>
- Kimball C. Atwood IV, MD Naturopathy: A Critical Appraisal Medscape General Medicine. 2003;5(4) https://www.medscape.com/viewarticle/465994_print

REFERENCES

Wellman, Nancy S. The Nutrition Screening Initiative Nutrition Reviews; Oxford Vol. 52, Iss. 8, (Aug 1994): S44.

Marrie RA, Horwitz R, Cutter G, Tyry T, Campagnolo D, Vollmer T Comorbidity delays diagnosis and increases disability at diagnosis in MS. *Neurology*. 2009;72(2):117-124.

Social Determinants of Health: Know What Affects Health <https://www.cdc.gov/socialdeterminants/index.htm>

Healthy People 2020 Social Determinants of Health <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>

[Health Literacy Interventions and Outcomes: an Update of the Literacy and Health Outcomes Systematic Review of the Literature](https://www.ahrq.gov/downloads/pub/evidence/pdf/literacy/literacyup.pdf)

<https://www.ahrq.gov/downloads/pub/evidence/pdf/literacy/literacyup.pdf>

Bowling AC. *Optimal Health with Multiple Sclerosis : A Guide to Integrating Lifestyle, Alternative, and Conventional Medicine*. New York, NY: Demos Medical Publishing, LLC; 2014.

Harrison, C. Anti-Diet: Reclaim Your Time, Money, Well-Being, and Happiness Through Intuitive Eating Little, Brown Spark (December 24, 2019)

Harrison, Christy. FNCE Debate Slides: Health At Every Size vs. Weight Management. October 2018.

Mastrocola M.R, Roque S.S, Benning L.V, Stanford F.C. Obesity education in medical schools, residencies, and fellowships throughout the world: a systematic review. *International journal of obesity*. 2019;(2019).

Devries S, Willett W, Bonow RO. Nutrition education in medical school, residency training, and practice. *Jama*. 2019;321(14):1351-1351.

**THANK
YOU!!**

QUESTIONS?

Mona@MSBites.com

